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Preface

Autophagy

Since the discovery of yeast autophagy-related genes (current *ATG* genes) in the early 1990s, the autophagy research field has grown exponentially. The number of published papers related to autophagy was less than 100 per year before 2000; however, in 2009, it exceeded 1600. Moreover, autophagy has also been discussed not only in scientific journals. There is a very popular Japanese comic (manga) magazine, "Weekly Shonen (means boys) Jump", with a weekly a circulation of more than 2 million. In two issues in 2009, autophagy appeared in a story in which a hero fought against an enemy. The hero was starved, but was activated by inducing autophagy (unfortunately, the effect did not last long). This magazine told more than 2 million children (and some adults) that we have a unique strategy, autophagy, to survive starvation. This shows how times have changed; just 10 years ago, autophagy was of very minor importance even within the scientific community.

Progress has been made in understanding both the molecular mechanism and the physiologic and pathologic roles of autophagy. The breakthrough brought by yeast genetic studies led to the identification of homologs/counterparts in other species including mammals, although some have been identified only recently. In addition to these classical *ATG* genes, higher eukaryote-specific factors have also been discovered. It appears that the basic mechanisms are evolutionarily conserved, whereas divergent regulatory elements have developed.

Using forward and reverse genetic approaches, the roles of autophagy have been studied in various organisms and it is now known that autophagy is involved not only in starvation adaptation, but also in intracellular quality control, development, anti-aging, clearance of intracellular microbes, antigen presentation, and protection against diseases such as neurodegenerative disease and cancer. Therefore, understanding of autophagy is vital for current life science.

In this FEBS Letters Special Issue on Autophagy, we have invited 21 researchers/groups to review the most updated information and discuss our future directions. We are most grateful to the authors for these outstanding mini-reviews, and to the reviewers for their expert comments and criticism.

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